WHAT IS CLAIMED IS:

1. An optical pick-up apparatus using a holographic optical element, comprising:

a light emitting element for generating three beams with different wavelengths;

a multiplexed holographic optical element provided with three holographic gratings for receiving beams reflected from an optical disc and diffracting the received beams according to wavelengths of the received beams; and

a light receiving element for receiving beams that are diffracted while passing through the multiplexed holographic optical element.

2. The apparatus according to claim 1, wherein the three holographic gratings of the multiplexed holographic optical element are formed on a same surface of a single substrate.

3. The apparatus according to claim 1, wherein the three holographic gratings of the multiplexed holographic optical element are arranged in layers.

4. The apparatus according to claim 3, wherein the multiplexed holographic optical element comprises:

a transparent substrate on which a first holographic

grating is formed;

a first transparent layer on which a second holographic grating is formed; and

a second transparent layer on which a third holographic grating is formed.

5. The apparatus according to claim 4, wherein the first to third holographic gratings are formed so that their grating depths are different from each other.

6. The apparatus according to claim 5, wherein a grating depth of the first holographic grating is formed to be one of 1.2~1.3 μm, 1.5~1.6 μm, or 2.2~2.4 μm, a grating depth of the second holographic grating is formed to be one of 1.2~1.3 μm, 1.5~1.6 μm, or 2.2~2.4 μm except the grating depth of the first holographic grating, and a grating depth of the third holographic grating is formed to be one of 1.2~1.3 μm, 1.5~1.6 μm, or 2.2~2.4 μm except the grating depths of the first and second holographic gratings.

7. The apparatus according to any of 1 to 3 claims, wherein the multiplexed holographic optical element further comprises a diffraction grating that diffracts a beam emitted from the light emitting element to be divided into a 0 order beam, a +1 order beam and a -1 order beam.

8. The apparatus according to claim 1, wherein the light emitting element and the multiplexed holographic optical element are fixedly located on a single package, and the light receiving element is located in a lower portion of the package to be independently movable.

9. The apparatus according to claim 1, wherein the light emitting element emits three beams having wavelengths of 650 nm, 780 nm and 405 nm, respectively.

10. An optical pick-up apparatus using a holographic optical element, comprising:

a package having a light emitting element generating at least three beams with different wavelengths, a multiplexed holographic optical element having a diffraction grating that divides a beam emitted from the light emitting element into three beams and at least three holographic gratings receiving beams reflected from an optical disc and diffracting the received beams according to wavelengths of the received beams, and a light receiving element receiving beams that are diffracted while passing through the multiplexed holographic optical element;

an object lens for collecting beams on a track of the optical disc; and

a collimator lens.

11. The apparatus according to claim 10, wherein the multiplexed holographic optical element is fixedly located over an opening formed in an upper portion of the package, and the light receiving element is movably located directly under an opening formed on a lower portion of the package.

12. The apparatus according to claim 11, wherein the light receiving element is located outside the package to be independently movable.

13. A method of forming holographic gratings in multiple layers, comprising the steps of:

forming a first holographic grating on a transparent substrate;

forming a first transparent layer on the transparent substrate on which the first holographic grating is formed;

forming a second holographic grating on the first transparent layer;

forming a second transparent layer on the first transparent layer on which the second holographic grating is formed; and

forming a third holographic grating on the second transparent layer.

14. The method according to claim 13, wherein the first and second transparent layers are formed by means of coating of glass or optical polymer.

15. The method according to claim 14, wherein the first and second transparent layers are each formed to be 1 μm to several tens of μm thick.

16. The method according to claim 13, further comprising the step of forming a diffraction grating on a lower surface of the transparent substrate.

17. A method of forming holographic gratings in multiple layers, comprising the steps of:

coating a transparent substrate with first photoresist;

selectively exposing the first photoresist to light through a first mask having a same pattern as a first holographic grating and developing the first photoresist;

forming the first holographic grating on the transparent substrate by etching the first photoresist and the transparent substrate;

forming a first transparent layer by coating glass or optical polymer on the transparent substrate on which the first holographic grating is formed;

coating the first transparent layer with second photoresist;

selectively exposing the second photoresist to light through a second mask having a same pattern as a second holographic grating and developing the second photoresist;

forming the second holographic grating on the first transparent layer by etching the second photoresist and the first transparent layer;

forming a second transparent layer by coating glass or optical polymer on the first transparent layer on which the second holographic grating is formed;

coating the second transparent layer with third photoresist;

selectively exposing the third photoresist to light through a third mask having a same pattern as a third holographic grating and developing the third photoresist; and

forming the third holographic grating on the second transparent layer by etching the third photoresist and the second transparent layer.

18. The method according to claim 17, further comprising the step of forming a diffraction grating on a lower surface of the transparent substrate.

19. The method according to claim 17, wherein the first

and second transparent layers are each formed to be 1 μm to several tens of μm thick.